REMARKS

Claims 1-15 and 18-40 are pending in the present application. Claims 1, 15, 18, 30 and 31 are the independent claims. In the Official Action, dated Jan. 9, 2004, claims 15-17 were rejected under 35 U.S.C. § 112, second paragraph. Claims 1-35 and 38-40 were rejected under 35 U.S.C § 103(a) as allegedly obvious over Blatter et al., U.S. Patent No. 2003/0014407 A1 ("Blatter"), in view of Blum et al., U.S. Patent No. 5,918,223 ("Blum"). Claims 36 and 37 were acknowledged as presenting allowable subject matter, but were objected to for depending from a rejected base claim.

In response to the points raised in the Official Action, claim 15 has been amended. Claim 15 now takes an independent form and is believed allowable for the reasons discussed below. An additional fee for conversion of a dependent claim into an independent claim is included with this response, pursuant to 37 C.F.R. 1.16(b). Claims 16 and 17 have been cancelled. The obviousness rejections to claims 1-35 and 38-40 are respectfully traversed, rendering the objections to claims 36 and 37 moot.

With regard to claims 15, this claim has been amended to correct informalities and the amendments are in no way intended to limit the previous scope of the claim. It is Applicants' explicit intent that the amended claim retain the full scope and breath of claimed subject matter as the original claim, and nothing herein should be interpreted to the contrary. Likewise, the cancellation of claims 16 and 17 was for the purpose of correcting formalities and saving costs in filing additional independent claims, not for the purpose of narrowing the breadth of any non-cancelled claims.

The following format will be used to cite references in this response: the application for the present invention will be referred to as "App." followed by the appropriate page and line number, e.g. "App. 2:23" refers to the application at page 2, line 23. The Official Action of Jan. 9, 2004 will be referred to as "Official Action" followed by the page and paragraph number, e.g. "Official Action 4:3" refers to the Official Action page 4, paragraph 3 (incomplete paragraphs at the top of a page not counted). Patents will be referred to by an inventor, as set forth above, followed by a column and line number, e.g. "Blum 3:27" or a page and paragraph number, e.g. "Blatter 2:0014."

Summary of the Invention

The invention provides a system for automatically classifying media entities, for example songs. App. 6:17-6:20. Songs can be first classified by human experts who assign them to classes based on perceptual properties. App. 6:20-6:22. Each class corresponds to a given subset of perceptual properties, forming a classification chain that is suited to searching and sorting databases of songs. App. 6:19.

The songs in any class can be analyzed using digital signal processing ("DSP"). App. 6:22-6:24. Subsets of perceptual properties, as determined by the human experts, may be correlated to DSP properties. App. 6:22-6:24. When such a correlation is found, it can be identified in a feature vector that includes the class to which a song belongs as well as the corresponding DSP characteristic. App. Fig. 4C. It is the marriage or convergence of the two analyses [perceptual and DSP] that provides a stable set of classified songs. App 10:20-10:21.

Blatter

Blatter relates to matching people to media objects, e.g. songs. Blatter 1:0011. Songs are stored in a database, and user profiles are stored in a database. Blatter 2:0021. Songs are stored with "media properties" that are used to determine which demographics will enjoy a song. Blatter 2:0022 (explains a media object database that stores media objects and media properties). User profiles comprise demographic and other information gathered by asking questions of people. Blatter 2:0027. The user profiles are then analyzed to generate a score, and the score is correlated to the media properties in the song database, resulting in the recommendation of a song or set of songs to a user. *See* Blatter 2:0011. Blatter does not correlate classes of perceptual properties with DSP characteristics, as is done in the feature vectors of the present invention. Nor does Blatter identify a media entity with a class of perceptual properties and a DSP characteristic. Instead, Blatter teaches away from using DSP to categorize songs, "existing methods for recommending content to consumers are ineffective...DSP...is very ineffective in finding songs which 'sound similar' to a given song..." Blatter ¶1:0004.

Blum

A summary of Blum is provided in the background section of the application. App. 4:2-5:24. It is referred to therein as the Muscle Fish Patent (the assignee). As described in the background section, Blum is an example of an ineffective attempt, in applicants' view, at automatically categorizing media entities, e.g. songs, using DSP. App. 5:8-5:15. Blum identifies certain pre-selected acoustical features of songs, and "the choice of which acoustical features to measure is critical to the success of the invention." Blum 3:6. Once these pre-selected features

are identified, they can be searched by users for simile to other songs, certain acoustical/perceptual features, certain predefined subjective features, and onomatopoeia—or similarity to a sound quality. Blum 3:41-3:56. Blum does not correlate classes of perceptual properties with DSP characteristics, nor does it identify a media entity with a class of perceptual properties and a DSP characteristic. Instead, Blum selects DSP characteristics, and identifies and stores those characteristics for various entities. No perceptual properties are stored with Blum's DSP characteristics.

Rejection of Claims 1-35 and 38-40 under 35 U.S.C. § 103(a)

Claims 1-35 and 38-40 were rejected under 35 U.S.C § 103(a) as allegedly obvious over Blatter in view of Blum. Rejections under 35 U.S.C. 103(a) require that a reference or combination of references disclose every element of the claim. As stated in the MPEP, "the prior art references must teach or suggest all the claim limitations." MPEP § 706.02(j). Also, "[o]bviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art." MPEP 2143.01.

Claims 1-35 and 38-40 each contain at least one element that is not present in any of the references. Independent claim 1 provides:

> 1. A method of classifying data according to perceptual properties of the data, the method being suited for searching and sorting large databases of media entities, including music, video and image databases, the method comprising:
> assigning to each media entity of a plurality of media entities in a data set to at least one class, each class of said at least one class corresponding to a subset of perceptual properties pre-defined for the data set;

Blum = pre-selected.

processing each media entity of said data set to extract at least one digital signal processing characteristic for each media entity;

generating a plurality of feature vectors for said plurality of media entities, wherein each vector includes said at least one class and said at least one digital signal processing characteristic; and

forming a classification chain based upon said plurality of feature vectors.

As the bolded text suggests, the references, taken alone or in combination, do not disclose "*generating a plurality of feature vectors for said plurality of media entities, wherein each vector includes said at least one class and said at least one digital signal processing characteristic.*" This element of claim 1 teaches feature vectors with at least two components: first, "said at least one class," and second, "said at least one digital signal processing characteristic."

"Said at least one class" refers to language also in claim 1 that defines the term as "corresponding to a subset of perceptual properties." The ordinary dictionary meaning of "perceptual" is "of, based on, or involving perception." American Heritage College Dictionary (2002) at 1033. The term "perception" refers us to the term "perceiving," which is in turn defined as, "To become aware of directly through any of the senses, esp. sight or hearing." American Heritage College Dictionary (2002) at 1032. Awareness through sight or hearing is a uniquely human capacity. Therefore, the feature vectors of claim 1 include a first property of at least one class corresponding to a subset of perceptual properties, i.e. properties that are identified by a human.

"Said at least one digital signal processing characteristic" refers to established DSP techniques in which patterns and attributes of a digital signal are analyzed with a computer.

Therefore, the feature vectors of claim 1 also include a second property of at least one DSP characteristic.

None of the references disclose or suggest a feature vector that couples a subset of perceptual properties and a DSP characteristic. The official action acknowledged this, in part, by indicating that claims 36 and 37 contain allowable subject matter. Official Action 8:4. Applicant submits that by including feature vectors comprising perceptual properties into independent claim 1, allowable subject matter from claims 36 and 37 is in fact also present in claim 1. Perceptual properties are by definition identified by human beings.

Blatter does not teach feature vectors. Official Action 3:5. More specifically, the feature vectors of the invention are a mechanism to correlate classes of perceptual properties with DSP characteristics, and as pointed out in the summary of Blatter above, Blatter does not generate such feature vectors.

Blum also does not teach the feature vectors of claim 1. While the Official Action correctly points out that Blum discloses one kind of feature vector, Official Action 3:5, it is silent as to whether Blum, Blatter, or any other reference discloses a feature vector that "includes said at least one class and said at least one digital signal processing characteristic," where "said at least one class" corresponds to a subset of perceptual properties. Once again, the feature vectors of the invention are a mechanism to couple classes of perceptual properties with DSP characteristics, and such coupling is not presented in Blum. Instead, Blum discloses feature vectors with only DSP characteristics:

> The invention first measures a variety of acoustical features of each sound file...The invention measures the loudness, bass, pitch, brightness, bandwidth,

> and Mel-frequency cestral coefficients (MFCCs) at periodic intervals (referred to as "frames")over the length of the sound file...This set of statistical measurements is represented as an N-vector...also known as a "feature vector."

Blum 3:4-3:19. It is clear from this quotation of Blum that the feature vectors presented therein comprise only DSP characteristics, and do not comprise any class that corresponds to a subset of perceptual properties, or even reference to such a class.

It is respectfully submitted that independent claim 1 is patentable over both Blatter and Blum, whether taken alone or in combination. As claims 2-14 depend either directly or indirectly from claim 1, they are believed allowable for the same reasons. Claim 15 comprises a computer readable medium with instructions for performing the method of claim 1, and so also is believed allowable for the same reasons. Withdrawal of the rejections under 35 U.S.C. § 103(a) is thus earnestly requested.

The remaining independent claims each present some variation of the feature vector that "includes said at least one class [corresponding to a subset of perceptual properties] and said at least one digital signal processing characteristic," from claim 1. Independent claim 18 teaches the following:

> 18. A computing system, comprising:
> a computing device including:
> a classification chain data structure stored thereon having a plurality of **classification vectors, wherein each vector includes data representative of at least one perceptual class as classified by humans and digital signal processing data as classified by at least one computing device**; and
> processing means for comparing an unclassified media entity to the classification chain data structure to determine at least one perceptual class of said unclassified media entity.

Here, the "feature vector" is replaced with a "classification vector." While the terminology has changed somewhat, the elements that define over the prior art remain in the claim. The classification vector is an entity that includes at least two members, those members are coupled together within the classification vector by virtue of being included in it. Again, one of the members is a "data representative of at least one perceptual class as classified by humans" and "digital signal processing data." It should be clear that this is similar to the feature vector of claim1 that includes a class that correlates to a subset of perceptual properties and at least on DSP characteristic. For the reasons set forth above, claim 18 is also patentable over Blatter and Blum, taken alone or in combination. As claims 19-29 depend either directly or indirectly from claim 18, they are believed allowable for the same reasons. Withdrawal of the rejections to these claims under 35 U.S.C. § 103(a) is thus earnestly requested.

Independent claim 30 provides:

> 30. (original) A classification chain data structure utilized in connection with the classification of new unclassified media entities, comprising:
> a plurality of classification vectors, wherein **each vector includes:**
> **perceptual data classified by humans; and**
> **digital signal processing data** classified by at least one computing device.

Once again, a classification vector is present that includes both perceptual data classified by humans and DSP data. These features are not grouped together in the prior art, in classification vectors or otherwise. For the reasons set forth above, claim 30 is also patentable over Blatter and Blum, taken alone or in combination. Withdrawal of the rejection to this claim under 35 U.S.C. § 103(a) is thus earnestly requested.

Independent claim 31 provides:

31. (original) A method of generating a classification chain having a plurality of vectors describing a plurality of media entities, comprising:

assigning, by an expert, **a first value to a media entity according to a pre-defined perceptual characteristic** of media entities;

assigning, by a computing system, **a second value to the media entity according to a pre-defined digital signal processing characteristic**;

generating a vector based on at least said first value and said second value; and

adding said vector to a classification chain data structure.

Here again is a vector that includes data relating to both a perceptual characteristic and a DSP characteristic. This time the vector is "based on said first value and said second value." Where the first value is assigned to a media entity according to a perceptual characteristic and a second value is assigned to a media entity according to a DSP characteristic. Once again, while this claim is somewhat different than claim 1, it teaches the grouping of features (by generating a vector based on said first and second value) that are not grouped together in the prior art. For the reasons set forth above, claim 31 is also patentable over Blatter and Blum, taken alone or in combination. As claims 32-40 depend either directly or indirectly from claim 18, they are believed allowable for the same reasons. Withdrawal of the rejection of claim 31 will render the objections to claims 36 and 37 moot. Withdrawal of the rejections to these claims under 35 U.S.C. § 103(a) and corresponding objections is thus earnestly requested.

CONCLUSION

Applicant believes that the present reply is responsive to each of the points raised by the Examiner in the Office Action, and submits that Claims 1-15 and 18-40 of the application are in condition for allowance. Favorable consideration and passage to issue of the application at the Examiner's earliest convenience is earnestly solicited.

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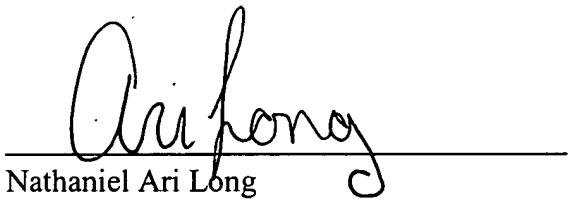

Nathaniel Ari Long
Registration No. 53,233

Woodcock Washburn LLP
One Liberty Place - 46th Floor
Philadelphia PA 19103
Telephone: (215) 568-3100
Facsimile: (215) 568-3439